pothesis, when an infected person makes antibodies to the HIV hook, these antibodies would also attach to the "self" areas of white blood cells, blocking their function or leading to their demise. The scientists' conclusion explains why, as observed in AIDS patients, the virus can infect only 0.01 to 0.1 percent of its CD4 cells yet still devastate the immune system.

The hypothesis also implies that immune system suppressants like cyclosporine could prevent the deadly white blood cell loss. Cyclosporine has been tried by French researchers in AIDS patients (SN: 11/9/85, p.293), but the researchers have not yet published their results. There may be nothing left to restore by the time a person has AIDS, Ziegler says, but he and his colleagues are beginning a preliminary trial of cyclosporine in humans. They are also looking for the hypothesized antibody that reacts with HIV and with white blood cells.

The CD8 and autoimmune theories are not mutually exclusive. "It could be," says Levy, "that the suppressor cell, by blocking the virus, would also prevent the production of autoantibodies." The autoantibodies could be a secondary effect that makes things worse, he suggests.

The third study, like the other two, has treatment implications. Using a paradigm set up for studying brain neuropeptides and their receptors, researchers found a short peptide on the HIV envelope protein that binds to brain cells in HIV infection. By adding just the peptide to a cell culture line, Candace B. Pert and Joanna M. Hill of the National Institute of Mental Health and several other government researchers were able to block entry of the whole virus, they report in the current PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (Vol. 83, No. 23). Analogs of the peptide also worked.

Pert's group plans to try injecting a long-lasting analog of the peptide in humans with AIDS in early 1987. For people already infected, says Hill, the peptide could block infection of new cells. Though the peptide would be blocking a receptor that presumably has a function besides serving as the HIV attachment site, the researchers aren't expecting that the blockage will cause serious side effects and have seen none in animal trials.

—J. Silberner

Hydrothermal discoveries from the deep

Since undersea "chimneys" were first discovered to be spewing out hot, mineral-laden water from the ocean floor (SN: 1/12/80, p.28), scientists have come to suspect that they are as important a source for ocean chemicals and heat as are land-based processes. This idea was fortified last week as researchers reported on hydrothermal venting at a variety of sites in the Pacific and Atlantic oceans. They presented their findings in San Francisco at the joint meeting of the American Geophysical Union and the American Society of Limnology and Oceanography.

One of the most exciting recent finds was made by the National Oceanic and Atmospheric Administration (NOAA) research ship *Discover*, which lived up to its name last August during a cruise over the Juan de Fuca spreading ridge, 400 miles off the coast of Oregon. *Discover's* towed instruments detected a new kind of hydrothermal plume that was much hotter, larger, shorter-lived and more symmetrically shaped than the plumes that normally emerge from seafloor vents. According to Edward Baker of NOAA's Pacific Marine Environmental Laboratory in Seattle, this plume — which was apparently released over a few days — contained 100 cubic kilometers of water. The amount of heat and chemicals in the plume was equivalent to that emitted by as many as 2,000 "black smoker" vents in one year.

Computer models suggest that the plume could have been formed by a long crack — about a kilometer long by one-third meter wide — that for a few days issued a "black curtain" of hot water and minerals, says Baker. Because of the plume's large size and its placement over the Juan de Fuca ridge — part of the 60,000-kilometer-long, seam-like network of spreading centers that churn out new seafloor worldwide — researchers suspect it was released during a small episode of seafloor spreading.

"Certainly there have been underwater volcanic eruptions, but we've not observed anything like this on a ridge crest before," says Stephen Hammond, director of the NOAA VENTS Program in Newport, Ore. Most geologic evidence for seafloor spreading is in the form of records of processes that act over millions of years, he says. The new plume offers a glimpse at seafloor spreading on the scale of days. "Since we really don't know the time rates of seafloor spreading," he adds, "this may be a very key observation."

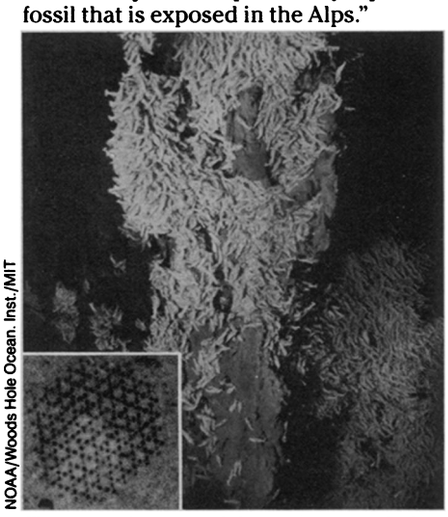
Researchers at the meeting also highlighted studies of vents on the Mid-Atlantic Ridge, which spreads much more slowly than its Pacific cousins. Last summer, with the help of the submersible *Alvin*, they found that the water chemistry and heat from Atlantic vents are similar to that emerging from vents along the East Pacific Rise.

"That's very unexpected," says Peter Rona of NOAA in Miami. "We thought these vents would be completely different, since they're on a slow-spreading ridge . . . which is a kilometer deeper and supposedly has a different kind of magma chamber under it."

Rona's group has also discovered two large mounds of polymetallic sulfides — compounds of potential economic importance that are deposited on the ocean bottom when the hydrothermal plumes hit the cold seawater. One mound, still being deposited, contains 4.5 million tons of sulfides and is the size and shape of the Houston Astrodome, says Rona. The group also found a much larger, inactive mound that they think was built up over tens of thousands of years.

The implications of this find, says Rona, "are that slow-spreading ridges may be more effective at concentrating larger sulfide deposits than are fast-spreading ridges, where the crust moves away much sooner from the heat source driving hydrothermal circulation."

The recent *Alvin* dives in the Atlantic gave biologists a closer look at Atlantic vent communities, including a newly discovered genus of shrimp found swarming around "black smoker" chimneys. Perhaps the most intriguing biological mystery in the vent area, however, was the finding of thousands of highly symmetric, Chinese-checkerboard-like patterns on the seafloor, which were first photographed several years ago. Rona thinks the pattern may be either an animal itself or the burrows made by an animal. He says the patterns are "dead ringers for a 70-million-year-old [*Paleodictyon*] trace fossil that is exposed in the Alps."



NOAA/Woods Hole Ocean. Inst./MIT

Treasures from the Atlantic vents include these newly identified shrimps. Biologists are unsure what food source sustains so many shrimp gathered around this hydrothermal chimney. The inset shows one of the thousands of checkerboard-like patterns on the seafloor, which may be living animals or their burrows.

Scientists took two core samples of these Atlantic patterns during the recent *Alvin* dives, but Rona says the biologists have not yet opened them. This part of the deep Atlantic, he says, may be a stable sanctuary for what may turn out to be the first living examples of an animal long extinct on the rest of the planet.

—S. Weisburd